

105 CMR: DEPARTMENT OF PUBLIC HEALTH

120.620: LICENSING AND RADIATION SAFETY REQUIREMENTS FOR IRRADIATORS

120.643: Access Control

(A) Each entrance to a radiation room at a panoramic irradiator must have a door or other physical barrier to prevent inadvertent entry of personnel if the sources are not in the shielded position. Product conveyor systems may serve as barriers as long as they reliably and consistently function as a barrier. It must not be possible to move the sources out of their shielded position if the door or barrier is open. Opening the door or barrier while the sources are exposed must cause the sources to return promptly to the shielded position. The personnel entrance door or barrier must have a lock that is operated by the same key used to move the sources. The doors and barriers must not prevent any individual in the radiation room from leaving.

(B) In addition, each entrance to a radiation room at a panoramic irradiator must have an independent backup access control to detect personnel entry while the sources are exposed. Detection of entry while the sources are exposed must cause the sources to return to their fully shielded position and must also activate a visible and audible alarm to make the individual entering the room aware of the hazard. The alarm must also alert at least one other individual who is onsite of the entry. That individual shall be trained on how to respond to the alarm and prepared to promptly render or summon assistance.

(C) A radiation monitor must be provided to detect the presence of high radiation levels in the radiation room of a panoramic irradiator before personnel entry. The monitor must be integrated with personnel access door locks to prevent room access when radiation levels are high. Attempted personnel entry while the monitor measures high radiation levels, must activate the alarm described in 105 CMR 120.643(B). The monitor may be located in the entrance (normally referred to as the maze) but not in the direct radiation beam.

(D) Before the sources move from their shielded position in a panoramic irradiator, the source control must automatically activate conspicuous visible and audible alarms to alert people in the radiation room that the sources will be moved from their shielded position. The alarms must give individuals enough time to leave the room before the sources leave the shielded position.

(E) Each radiation room at a panoramic irradiator must have a clearly visible and readily accessible control that would allow an individual in the room to make the sources return to their fully shielded position.

(F) Each radiation room of a panoramic irradiator must contain a control that prevents the sources from moving from the shielded position unless the control has been activated and the door or barrier to the radiation room has been closed within a preset time after activation of the control.

(G) Each entrance to the radiation room of a panoramic irradiator and each entrance to the area within the personnel access barrier of an underwater irradiator must ~~be posted as required by 105 CMR 120.238. Radiation postings for panoramic irradiators must comply with the posting requirements of 105 CMR 120.238, except that signs may be removed, covered, or otherwise made inoperative when the sources are fully shielded.~~ have a sign bearing the radiation symbol and the words, "Caution (or danger) radioactive material." Panoramic irradiators must also have a sign stating "High radiation area," but the sign may be removed, covered, or otherwise made inoperative when the sources are fully shielded.

(H) If the radiation room of a panoramic irradiator has roof plugs or other movable shielding, it must not be possible to operate the irradiator unless the shielding is in its proper location. The requirement may be met by interlocks that prevent operation if

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shielding is not placed properly or by an operating procedure requiring inspection of shielding before operating.

(I) Underwater irradiators must have a personnel access barrier around the pool which must be locked to prevent access when the irradiator is not attended. Only operators and facility management may have access to keys to the personnel access barrier. There must be an intrusion alarm to detect unauthorized entry when the personnel access barrier is locked. Activation of the intrusion alarm must alert an individual (not necessarily onsite) who is prepared to respond or summon assistance.

120.675: Personnel Monitoring

(A) Irradiator operators shall wear **a personnel dosimeter that is processed and evaluated by an accredited National Voluntary Laboratory Accreditation Program (NVLAP) processor** ~~either a film badge, a thermoluminescent dosimeter (TLD), or an optically stimulated luminescence (OSL) dosimeter~~ while operating a panoramic irradiator or while in the area around the pool of an underwater irradiator. The **personnel film badge, TLD or OSL dosimeter** processor must be accredited by the National Voluntary Laboratory Accreditation Program for high energy photons in the normal and accident dose ranges [see 105 CMR 120.225(C)]. Each **personnel film badge, TLD or OSL dosimeter** must be assigned to and worn by only one individual. Film badges must be processed at least monthly, and **other personnel TLDs and OSL dosimeters** must be processed at least quarterly.

(B) Other individuals who enter the radiation room of a panoramic irradiator shall wear a dosimeter, which may be a pocket dosimeter. For groups of visitors, only two people who enter the radiation room are required to wear dosimeters. If pocket dosimeters are used to meet the requirements of 105 CMR 120.675(B), a check of their response to radiation must be done at least annually. Acceptable dosimeters must read within $\pm 30\%$ of the true radiation dose.

120.691 Records and Retention Periods

The licensee shall maintain the following records at the irradiator for the periods specified.

(A) A copy of the license, license conditions, documents incorporated into a license by reference, and amendments thereto until superseded by new documents or until the Agency terminates the license for documents not superseded.

(B) Records of each individual's training, tests, and safety reviews provided to meet the requirements of 105 CMR 120.671(A), (B), (C), (D), (F), and (G) until three years after the individual terminates work.

(C) Records of the annual evaluations of the safety performance of irradiator operators required by 105 CMR 120.671(E) for three years after the evaluation.

(D) A copy of the current operating, safety, and emergency procedures required by 105 CMR 120.673 until superseded or the Agency terminates the license. Records of the radiation safety officer's review and approval of changes in procedures as required by 105 CMR 120.673(C)(3) retained for three years from the date of the change.

(E) **Evaluations of personnel dosimeters** ~~Film badge and TLD results~~ required by 105 CMR 120.675 until the Agency terminates the license.

(F) Records of radiation surveys required by 105 CMR 120.677 for three years from the date of the survey.

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(G) Records of radiation survey meter calibrations required by 105 CMR 120.677 and pool water conductivity meter calibrations required by 105 CMR 120.683(B) until three years from the date of calibration.

(H) Records of the results of leak tests required by 105 CMR 120.679(A) and the results of contamination checks required by 105 CMR 120.679(B) for five years from the date of each test.

(I) Records of inspection and maintenance checks required by 105 CMR 120.681 for three years.

(J) Records of major malfunctions, significant defects, operating difficulties or irregularities, and major operating problems that involve required radiation safety equipment for three years after repairs are completed.

(K) Records of the receipt, transfer and disposal, of all licensed sealed sources as required by 105 CMR 120.009 and 120.140.